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WHAT IS CLAIMED IS:

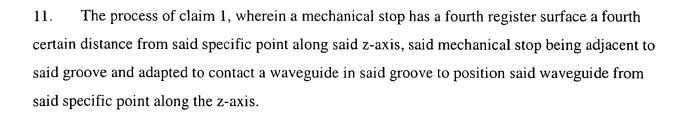
A process for preparing a substrate having alignment features for optical components, said substrate having an x, y, z, orientation and a substrate surface along an xz plane, said substrate having a specific point thereon, said process comprising:

applying a stop etch mask to a substrate, said mask defining the location on said substrate of a groove for receiving said waveguide and one or more fiducials for positioning said optical device on said substrate relative to said waveguide; and

etching said substrate to define said fiducials and said groove, said groove being dimensioned to receive at least a portion of a waveguide and said fiducials enabling said optical device to be positioned on said substrate such that it is optically aligned with said waveguide.

- 2. The process of claim 1, wherein said etching comprises using an inductively coupled plasma etching process.
- 3. The process of claim 2, wherein said inductively coupled plasma etching process is a Bosch process.
- 4. The process of claim 1, wherein at least one of said fiducials comprises a planar surface substantially perpendicular to said substrate surface, and said groove is deeper than 13μ m from said substrate surface.
- 5. The process of claim 4, wherein said groove is a U-groove.

- 6. The process of claim 5, wherein said U-groove has a bottom at about 60 to about $65\mu m$ from said substrate surface.
- 8. The process of claim 6, wherein etching said U-groove comprises etching a U-groove terrace, said U-groove and U-groove terrace defining edges for receiving a waveguide.
 - 7. The process of claim 1, wherein said substrate is form from a materials selected from the group consisting of polycrystalline silicon, silica, and ceramics.
 - 8. The process of claim 1, further comprising etching an etched field encompassing said fiducials.
 - 9. The process of claim 1, wherein a first fiducial defines a first register surface a first certain distance from said substrate surface along said y-axis, a second fiducial defines a second register surface a second certain distance from said specific point along said x-axis, a third fiducial defines a third register surface a third certain distance from said specific point along said z-axis, and wherein said groove, and said first, second and third fiducials are located on said substrate using the same mask.
- 20 10. The process of claim 9, wherein a mechanical stop has a fourth register surface a fourth certain distance from said specific point along said z-axis, said mechanical stop being adjacent to said groove and adapted to contact a waveguide in said groove to position it from said specific point along the z-axis.



- 12. The process of claim 1, further comprising disposing an optical device on said substrate in a certain position relation with respect to said fiducials.
- 13. The process of claim 12, wherein optical device is disposed on said substrate by visually aligning said optical device to said fiducials.
- 14. The process of claim 12, wherein said optical device is disposed on said substrate by physically contacting said optical device with said fiducials
- 15. The process of claim 12, wherein further comprising disposing a waveguide in said groove
- 16. The process of claim 1, wherein the tolerance of the alignment of said groove to said fiducials is less than $\pm 0.2 \, \mu m$.

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- 17. The process of claim 1, wherein said waveguide is a fiber.
- 18. The process of claim 1, wherein said optical device is at least one of a laser, photodetector, or monitor.

- 19. A substrate formed according to the process of claim 1.
- An optical component substrate comprising:

 a groove for receiving a waveguide; and

fiducials for facilitating the alignment of an optical device on said substrate; wherein the tolerance of the alignment of said groove to said fiducials is less than $\pm 0.2 \mu m$.

An optical subassembly comprising:

an optical component substrate comprising at least:

a groove for receiving a waveguide; and

fiducials for facilitating the alignment of an optical device on said substrate; wherein the tolerance of the alignment of said groove to said fiducials is less than $\pm 0.2 \mu m$.

a waveguide disposed in said groove; and an optical device aligned with said fiducials.

- 22. The optical subassembly of claim 21, wherein said optical device is a laser.
- 20 23. A transceiver comprising the optical subassembly of claim 22.